

Two New Genera and a New Species of Bembicini
(Sphecidae) from North America, with a
Key to the Genera having Recessed
Ocelli

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In 1959 (p. 193) I indicated the existence of six groupings of species under the genus *Stictiella*, and mentioned that at least some were probably of generic rank. Later (1962, p. 563) the name *Stictiella* was restricted to two of these groups and four groups were segregated in a new genus, *Glenostictia*. In a revisionary work now being completed it has become desirable to refer to certain major patterns of differentiation among the bembicines in delineating probable origins and ancestral characteristics of the genus *Steniolia*. Two of the groups now under *Glenostictia* have been continually confirmed as of generic status since 1959. One of these is based upon an undescribed species and the other upon species that have been relatively poorly known, and both groups, in particularly the former, present characteristics of special importance to the understanding of *Steniolia*. Accordingly it appears opportune at this time to formulate their characteristics and present generic and species descriptions, thus facilitating reference to them and establishing them on an equitable basis with other higher categories of bembicines.

Xerostictia longilabris longilabris, new genus, new subspecies.
FIGS. 1-7.

Holotype.—♀, ARIZONA: PIMA CO. 12 miles SSW Ajo, fls. *Lycium*, 26.VII.61 (J. E. Gillaspv) [MCZ No. 30652].

Description of type female.—Length 16 mm. Erect and recumbent vestiture both very weakly developed, giving a bare

* This investigation was supported by a National Science Foundation grant (NSF-G17497) for study of the evolution of structure and behavior of nyssonine digger wasps.

appearance; no thickened silvery-appressed hairs forming reflective surfaces. Sculpture mostly fine and dense, coarser on most dorsal surfaces, coarsest medially on metasomal tergite 6 as a faintly indicated pygidial area, without definite carinae. Color pattern intense black with very extensive, almost entirely light yellow maculation but distal four segments of antenna reddish-brown beneath and small areas of clear cuticle without underlying pigmented epidermis present on pronotum and elsewhere, especially free margins of sclerites, which may appear black if overlying another layer of integument which is black. Maculate areas: mandible base before preapical tooth; labrum; clypeus; face except tentorial area, narrow extension downward of black along lateral ocellar-frontal furrow almost to frontal pit and narrow area about anterior ocellar lunule; very broad posterior orbits, extending into occipital area medially and ventrally, at no place narrower than widest diameter of scape; scape except dorsal-apical spot; remainder of antenna ventrally; pronotum entirely except minor sutural black behind neck; mesoscutum more than half, as longitudinal notaular and lateral stripes, former narrowly incomplete anteriorly, separate from one another postero-medially, broader than black parapsidal lines beside them, at least at broadest point; scutellum predominantly, except antero-median black which with that of mesoscutum forms sidewise theta-like figure incorporating parapsidal sutures in its lateral periphery, median mesoscutal sutures in its diametric stripe, and posterior border which is largely clear but has some black, not as continuous band turning forward into axillary fossa laterally; metanotum except anterior black which scarcely exceeds overlying scutellar margin; tegulae anteriorly, clear posteriorly; remainder of mesosoma almost entirely, with very little black other than small spot behind pronotal lobe, at pleural arm pit, epimeral pit, thin sutural black along mesopleural and metapleural sutures, in former interrupted above pleural arm pit, narrow antero-median crescent restricted to basal half of basal area, and thin extra-triangle V, apically bisected to posterior propodeal pit and including post-spiracular serifs on propodeum; coxae and trochanters almost totally;

femora except narrow longitudinal postero-dorsal line, progressively reduced from first to more posterior femora, vestigial on metafemora; tibiae and tarsi (except claws and arolia) entirely; tergite 1 except anterior face between spiracles, two discal spots, fused to each other, and thin posterior border ending laterally before point of intersection of extrapolation of subspiracular suture; tergite 2 except small basal-lateral spots, transverse, barlike gradular spots and narrow posterior margin; tergites 3-5 similar to tergite 2 except gradular spots adnate to basal black, posterior marginal black progressively reduced, absent on 5; tergite 6 except lobate basal black on either side, without median wedge; sternite 1 except very small lateral spot of either side; sternite 2 except thin antecostal margin; sternites 3-5 except narrow antero-median lobe, increasing on more posterior sternites; sternite 6 except narrow basal band, which is angulately produced medially and on each side.

Structural characters of female. Head: Slightly wider than mesosoma at pronotal lobes ($1.04 \times$); labial palpus 2-segmented, maxillary palpus 4-segmented; maxilla (measured from base of palpus) $1.4 \times$ height of compound eye; labrum $1.9 \times$ longer than basal width, narrowed at beginning of apical third, surface simply conic, not swollen, pyriform; clypeus $1.7 \times$ wider than median length, moderately protuberant as viewed in lateral aspect, surface evenly rounded, finely and uniformly punctate except along antero-median border, vestiture extremely fine and inconspicuous, clypeus appearing bare; dorsal margin of clypeus attaining but not exceeding lower level of antennal sockets; sockets widely spaced, intersocketal distance one and one-fourth times socket-eye distance; front narrow, moderately and almost uniformly divergent above and below, narrowest point slightly above antennal sockets, this slightly more than one-third of total head width ($1.0:2.8$) and exceeded about one-tenth by distance of eyes apart at vertex ($1.1:1.0$); sutural arch of lunule or lens of anterior ocellus slightly longer than wide ($1.1:1.0$) but floor of ocellar pit distinctly longer than wide ($1.4:1.0$) vertically between dentlike depression above and another below lunule; crest of mounded surface also describing vertically

elongate figure (1.4:1.0); vertex slightly depressed beside lateral ocelli, but interocellar mound extending slightly above eyes; occipital carina weak behind vertex but not deviating from evenly arcuate course. *Antennae*: Scape slender (3.1:1.0), first five segments 61:13:54:35:30. *Legs*: Arolium distinct, moderately developed, about one-third claw length or less. *Wings*: Length distad of humeral plate $2.27 \times$ width of mesosoma at pronotal lobes.

Allotype.—♂, same data as holotype. [MCZ No. 30652].

Description of allotype male.—Length 14 mm. Vestiture and black markings developed more strongly than in female, maculation of similar hue to that of female, but with significant differences in black-maculate pattern. Head: Posterior orbits narrowed, at narrowest less than half of widest scape diameter. Mesosoma: Black spot on pronotum behind neck which does not extend posteriorly as far as halfway to prescutal margin of pronotum; maculate notaular stripes narrower than black parapsidal stripes laterad of them, extending from near anterior margin of scutum (as close as distance between median scutal lines) to posterior margin of scutum, where they end in clear integument which appears black because of underlying black-pigmented integument; notaular stripes distinctly separated medially near posterior scutal margin by black which traverses marginal area, which is clear to either side of the black; scutellum traversed by a complete maculate fascia, posterior margin broadly clear except median and bilateral black spots; metanotum with basal black conspicuous, but not extending posteriorly to middle of sclerite; propodeum with black basal crescent not extending postero-medially to margin of basal area, triangle thus broadly lined with yellow except notchlike apical black around posterior propodeal pit; lower mesepimeron broadly yellow but bordered by sutural black especially above; mesepisternal-mesosternal plate broadly yellow, but small spot of black present behind pronotal lobe, on mesosternum anteriorly, and before mesocoxa. *Legs*: Yellow except minor black of coxae and trochanters, narrow lines above on femora, and dusky spot above on distitarsi. Metasoma with discal black spots of

tergite 1 broadly fused and joined to basal black; remainder of mesosomal markings approximately as in female, except for some extension of black markings.

Structural characters of male. Antennae: Segments from 3 outwardly exhibiting progressive modification from simple cylindrical; segment 4 with narrow tyloidal carina, recognizable also on succeeding segments, where there is development of a transversely flattened area dorsad of it, this becoming longitudinally bowed and glabrous on segment 8 and following segments; segment 4 faintly emarginate apically on tyloidal side, this more pronounced on following segments except segment 13. Legs: Femur 2 serrate-carinate from near base to apex, with almost even gradation to longer teeth apically, serrations traversing medial aspect of femur in basal half, in apical half deviating slightly to posterior then curving back and ending in tooth slightly anterior of middle; tibia slender, exteriorly flattened, longer than femur, apical calcar brownish, thickened, bluntly pointed; basitarsus inwardly emarginate, set with two long bristles at base, one bristle at apex of emarginated area. Metasoma: Sternite 2 with low median carina, developed most strongly somewhat before apical margin of sclerite; sternite 6 faintly emarginate apically, otherwise normal; tergite 7 with basal glabrous band above spiracular lobes, width of band uniform, not definitely angulated postero-medially, extending almost one-third length of segment; spiracular lobes short, truncated slightly beyond spiracle, surface almost entirely glabrous; inner rim of tergite 7 above spiracular lobe developed into a broad thin flange anteriorly, this lying inward to sternite 7 and the spiracular lobe, respectively; sternite 8 with slender ventral process; genitalic cuspis equal to digitus.

Paratypes.—ARIZONA: PIMA Co. Ajo, ♀, fls. *Bebbia juncea*, 27.VII.61 (J. E. Gillaspay). Ajo, 12 miles SSW, 1 ♂, 1 ♀, fls. *Lycium*, 26.VII.61; 2 ♂, 11 ♀, fls. *Lycium*, 27.VII.61 (J. E. Gillaspay). Childs, 2 ♂, 1 ♀, fls. Compositae, 26.VII.61 (J. E. Gillaspay). Sells, 9 miles W of, ♀, 7.VIII.55 (G. D. Butler and F. G. Werner, University of Arizona). YUMA Co. Roll, ♂, alfalfa, 6.VIII.54 (G. D. Butler, University of Arizona). CALIFORNIA: RIVERSIDE Co. Palms to Pines Highway, San Jacinto

Mts., 3200 ft, ♂, on *Larrea divaricata*, 27.VII.50 (P. H. Timberlake, University of California at Riverside). SAN DIEGO CO. Borrego Vly., ♂, 29.VIII.58 (E. I. Schlinger, University of California at Riverside).

Variation of paratypes.—Females range in length from 15 to 18 mm, males from 13 to 17 mm. Color pattern of the female exhibits minor variation, as exemplified by three specimens having maculate stripes between the median mesoscutal lines, while on the metasoma tergite 1 may have the discal spots completely fused or completely separate and tergite 2 may have the discal (gradular) spots basally adnate at one extreme or completely absent at the other, and one specimen has discal spots of tergites 1-6 all attached to basal black. In the male the notaular macula is slightly wider at its widest than the parapsidal black stripe beside it in all specimens except the type.

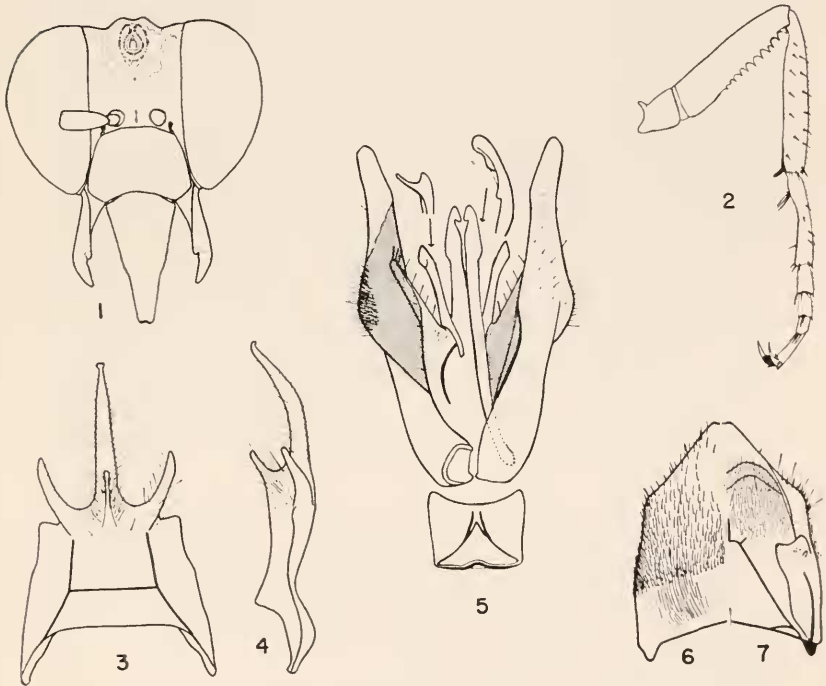
Xerostictia longilabris boharti, new subspecies

Holotype.—♀, MEXICO: BAJA CALIFORNIA. San Pedro, 7.X.41 (Ross and Bohart, California Academy of Sciences) [CAS].

Description of holotype female.—Length 14 mm. Pattern consists of essentially the same black and maculate markings as in the typical subspecies, but the black is much more extensive at each site. Specific differences from the type of *longilabris* include: Head: Posterior orbits at narrowest much less than scape diameter. Mesosoma: Rectangular black area on pronotum extending approximately half-way from neck to posterior margin of pronotum; notaular maculate stripes much narrower than black parapsidal stripes beside them; scutellum with black posterior border which turns forward into axillar fossa laterally; metanotum with anterior black extending posteriorly almost to middle of sclerite on the midline; black in basal area of propodeum attaining posterior declivity marking boundary of basal area; mesopleural suture entirely traced with black. Metasoma: Tergite 1 with median black lobe from basal black extending over area where discal spots are located in the typical form, and this lobe narrowly attached distally, interrupting maculate fascia; tergites 2-6 with discal spots broadly attached to basal black.

Allotype.—♂. MEXICO: BAJA CALIFORNIA. Pescadero, S.X.41 (Ross & Bohart, California Academy of Sciences) [CAS].

Description of allotype male.—Length 15 mm. Pattern basically that of typical subspecies but black markings extended. Head: Posterior orbital maculae thin, ending before posterior angles of compound eyes. Mesosoma: Large somewhat quadrangular black spot behind neck, extending anteriorly across collar on either side and posteriorly to near prescutal margin, separated by distance about equal to distance between median scutal lines; notaular maculae less than two times longer than



FIGS. 1-7. *Xerostictia longilabris longilabris*: 1—head, female; 2—middle leg, male, anterior; 3—8th sternite, male, ventral; 4—8th sternite, male, lateral; 5—genitalia, male, ventral and dorsal; 6—7th tergite, male, dorsal; 7—7th tergite, male, ventral. Membranous areas stippled.

distance between median scutal lines; lateral maculae extending little beyond tegulae anteriorly; scutellum with maculation divided into a low triangle on either side, posterior margin broadly black and this turning anteriorly into axillary fossa on either side; metanotal black extending posteriorly beyond middle of sclerite; propodeum extensively black above, leaving only linear maculae along sides of triangle, confined to basal area; sides of propodeum with rather extensive maculation, one large area including postero-lateral angles and most of sides and a separate smaller area on and anterior to spiracular shield; lower plate of mesepimeron black, and this extending ventrally along posterior mesepisternal-mesosternal plate to beyond signum although not to midline, and anteriorly to signum and beyond signum on either side; black spot on anterior mesosternum and behind pronotal lobe well developed, leaving maculate band from mesopleural suture (upper epimeral plate) to midline and posteriorly to end of mesosternum; maculation of metapleural plates joined. Legs: Conspicuous black on coxae and trochanters, that of latter matching femoral stripe, which is broad and extends to near apex of femur on all legs; tibiae and tarsi entirely maculate except slight duskiness above on distitarsi. Mesasoma: Tergite 1 with extensive basal and apical black broadly joined medially, interrupting maculate fascia, discal spots invident in sessile lobe from basal black; remaining tergites with discal black spots broadly joined with basal black and black of apical margin well developed, but all maculate fasciae complete.

Paratypes.—MEXICO: BAJA CALIFORNIA. La Paz, 6 miles W, ♀, swept *Wislizenia*, 3.IX.59 (K. W. Radford and F. G. Werner, California Academy of Sciences); Mesquital, 20 miles N, ♀, 27.IX.41 (Ross and Bohart, California Academy of Sciences); San Ignacio, 15 miles N, ♀, 29.IX.41 (Ross and Bohart, California Academy of Sciences).

Variation of paratype females.—Length 15–17 mm. Triangular maculae of scutellum joined in one specimen, and maculate fascia of metasomal tergite 1 complete in the paratypes.

This subspecies is dedicated to Dr. George E. Bohart of the United States Department of Agriculture Bee Culture Laboratory, Logan, Utah.

Discussion.—The female specimens of *boharti* are quite constant in pattern, despite their widespread origins in Baja California. They may be conveniently distinguished from the typical form by having notaular maculae narrower than the parapsidal black stripes lateral to them, rather than broader; anterior black of metanotum extending well onto the discal portion of the sclerite, beyond the projecting scutellar margin, rather than exceeding the margin little if at all; posterior marginal black of the scutellium extending anteriorly into the axillary fossa rather than being definitely limited to the marginal area; and metasomal tergites without any free black discal spots, rather than usually with at least some free, or absent. The male of *boharti* is separable by its thin posterior orbital maculae, which end before the posterior angles of the eyes, rather than extending onto the vertex; extensive pronotal black, separated from the prescutal margin of the pronotum by about the interval between the median scutal lines, rather than being limited to the anterior half of the sclerite; short notaular maculae, not more than two times the scutal line interval in length, rather than ten times this value, or nearly so; black of posterior scutellar margin extending anteriorly into the axillary fossa; and reduction of maculation in the propodeal triangle to separate lateral lines confined to the basal area, rather than continuous across and largely filling the triangle, including the portion on the posterior face of the propodeum. There appear to be no pronounced structural differences between the two subspecies in either sex.

Xerostictia differs from all genera that are considered to be closely allied in its palpal formula (2 and 4 labial and maxillary segments, respectively), the degree of elongation of the labrum, which is about two times longer than its basal width, and the short spiracular lobes of the male 7th metasomal tergite, which are of unique form, truncated shortly beyond the spiracle. Among characters relating it to *Stictiella* are the serrate femur and other features of the middle leg of the male, the only slightly

depressed vertex, the slender distitarsi, and the protuberant clypeus. The moderate degree to which the arolium is developed may also indicate affinity with *Stictiella*. Indications of affinity to *Steniolia* are the slightly elongate anterior ocellar lunule and elongation of the mound associated with it; the rather long first flagellar segment; and elongation of the proboscis approaching that of *Steniolia*, associated with reduction in number of palpal segments; and male characters, including tendency toward a single rather than double process of sternite 2 represented by the low median carina, presence of a ventral spine on sternite 8, and the elongate genital cuspis.

MICROSTICTIA, new genus

Monedula: Handlirsch, 1890 (part); Fox, 1895 (part); Smith, 1908, Nebr. Univ. Stud. 8: 60-62 (part); Cresson, 1928, Mem. Amer. Ent. Soc. 5: 46.

Stictia: Michel, 1916, Trans. Amer. Ent. Soc. 42: 418-420 (part).

Stictiella: Parker, 1917, 1929 (part); Mickel, 1917, Can. Ent. 49: 285-286 (part); Mickel, 1918 (1917), Nebr. Univ. Stud. 17: 117-119 (part); Gillaspay, 1959 (part).

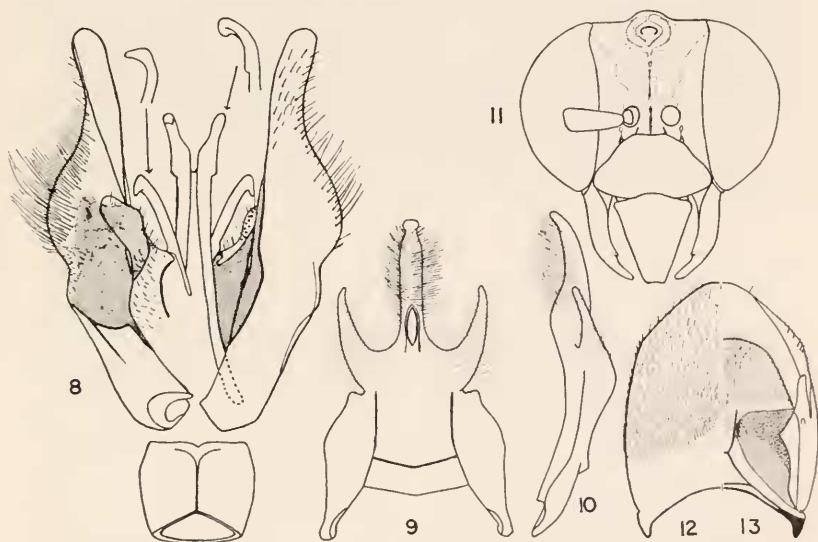
Glenostictia: Gillaspay, 1962 (part).

Type.—*Monedula femorata* Fox, 1895: 368 (Jacksonville, Florida) (= *Stictiella femorata*: Parker, 1917: 53; 1929: 46; = *Glenostictia femorata*: Gillaspay, 1962).

Description of genus.—Size small, length not exceeding 13 mm. Head: Labial and maxillary palpi normal, with 4 and 6 segments, respectively; proboscis less than $1.5 \times$ vertical eye length; labrum less than $1.5 \times$ longer than basal width, surface simply conic, not pyriform; clypeus truncated above, ending well below lower level of antennal sockets; anterior ocellus with circumocellar suture well-defined above the lunule, evenly arcuate and forming an arch which is about $2 \times$ wider than high, light-pervious surface beneath the arch fairly well defined and narrowly crescent-shaped but without a distinct sutural boundary below, where it slopes into a broad, dentlike depression; no distinct depression above the lunule; vertex not depressed below upper level of compound eyes either side of lateral ocelli, and

interocellar mound rising distinctly above eyes; occipital carina somewhat weakened behind vertex but its course smoothly arcuate, undeviating. Antennae: Flagellar segments short, with variation in length moderate, first flagellar segment about one-third longer than second; male with tyloidal carina on flagellar segments 2-11. Legs: Arolium distinct, moderate in development; male with femur 2 emarginate or entire, tibial calcar slender, light in color, and basitarsus variable but not emarginate and set with bristles. Metasoma (male): Sternite 2 with 2 (or 1 bifurcate) ventral processes; tergite 7 with short, narrow spiracular lobes and basal glabrous band over most of basal third of segment, this band angulately produced posteriorly on the midline; sternite 7 with an enclosure formed by posteriorly convergent apodemes; sternite 8 with a ventral process.

Discussion.—Three previously used names other than *femorata* apply to wasps which fall under this genus. These are



FIGS. 8-13. *Microstictia femorata*: 8—genitalia, male, ventral and dorsal; 9—8th sternite, male, ventral; 10—8th sternite, male, lateral; 11—head, female; 12—7th tergite, male, dorsal; 13—7th tergite, male, ventral. Membranous areas stippled.

Monedula minutula Handlirsch, 1890: 148 (Texas); *Monedula exigua* Fox, 1895: 370 (Montana); and *Stictiella divergens* Parker, 1917: 55 (Kansas). The three Arizona specimens which Parker assigned to *Stictiella exigua* served as primary basis for his concept of the species and represent a taxon apart from that of Fox. *Glenostictia gilva* Gillaspay is proposed as a new name for this entity, which is closely related to but apparently specifically distinct from *Glenostictia pulla* (Handlirsch). One of the two males Parker listed is from Congress Junction, Arizona (July, F. H. Snow, in University of Kansas collection) and this specimen is designated as holotype.

The two new genera presently described and three preexisting genera comprise a major bembicine taxon which is almost completely limited to the North American continent. Features which make clear the close relationship of these genera are largely associated with the ocelli, in particular the anterior ocellus, although all ocelli are recessed below the surface of the surrounding integument in a characteristic manner. The anterior ocellus, besides being located on the floor of a distinct depression, has a shallow dent or depression immediately anterior to the lunule or modified lens, and the surface about the ocellus is mounded, rising well above the surface of the lunule. The following key will enable separation of the genera concerned.

KEY TO GENERA

1. Labrum less than $1.4 \times$ longer than basal width and surface of simple conic form; labial palpus with 4 segments, maxillary palpus with 6 segments; proboscis less than $1.5 \times$ vertical eye length; sutural arch above anterior ocellar lunule at least slightly widened. 2
 - Labrum either longer than $1.4 \times$ basal width or surface pyriform, swollen at base; palpal segments fewer than above; proboscis usually $1.5 \times$ vertical eye length or more. 4
2. Sutural arch above anterior ocellus distinctly broadened, more than $1.5 \times$ wider than long; arolium distinct; male mesofemur entire or broadly emarginate; clypeus scarcely protuberant or not protuberant; length not over 13 mm **Microstictia**
 - Anterior ocellar arch distinctly less than $1.5 \times$ broader than long, often elongate. 3

3. Anterior ocellar arch slightly broader than long; arolium indistinct or small; male mesofemur serrate-carinate; clypeus rounded, protuberant; most species averaging over 13 mm in length.....**Stictiella**
 Anterior ocellar arch equidimensional or elongate; male mesofemur entire or notched near apex; arolium distinct; clypeus rather flattened, receding anteriorly; most species averaging over 13 mm in length.....**Glenostictia**
4. Labrum about $2 \times$ longer than basal width and surface of simple conic form; labial palpus with 2 segments, maxillary palpus with 4; proboscis about $1.5 \times$ longer than vertical eye length or slightly less.....**Xerostictia**
 Labrum less than $1.4 \times$ longer than basal width and pyriform, being swollen in basal half; labial palpus with 1 or 2 segments, maxillary palpus with 3 segments; proboscis more than $1.5 \times$ vertical eye length, usually distinctly so.....**Steniolia**

REFERENCES CITED

- FOX, W. J. 1895. Synopsis of the Bembicini of Boreal America. Proc. Acad. Nat. Sci. Phila. 351-374.
- GILLASPY, J. E. 1959. A new bembicine wasp related to *Stictiella tenuicornis* (Fox), with certain phylogenetic considerations (Hymenoptera: Sphecidae). Pan-Pacific Ent. 35: 187-94.
- GILLASPY, J. E., H. E. EVANS, and C. S. LIN. 1962. Observations on the behavior of digger wasps of the genus *Stictiella* (Hymenoptera: Sphecidae) with a partition of the genus. Ann. Ent. Soc. Amer. 55: 559-566.
- HANDLIRSCH, A. 1890. Monographie der mit *Nysson* und *Bembex* verwandten grabwespen. V. *Monedula*. Akad. Wien Sitzber. 99: 77-166, 1 pl.
- PARKER, J. B. 1917. A revision of the bembicine wasps of America north of Mexico. Proc. U. S. Nat. Mus. 52: 1-155.
- . 1929. A generic revision of the fossorial wasps of the tribes Stizini and Bembicini. Proc. U. S. Nat. Mus. 75: 1-230.